

AMENDMENTS TO THE CLAIMS

Please amend the claims as they currently stand so that they are in accord with the following listing of the claims:

Claim 1 (previously presented) A ligand detection device comprising:

a plurality of particles;

at least one receptor attached to each of said plurality of particles, wherein said at least one receptor is capable of binding at least one ligand to form a receptor-ligand complex; wherein the plurality of particles are positioned and moveable within an amount of a liquid crystalline material having the at least one ligand therein, wherein upon formation of said receptor-ligand complex, optical characteristics of said liquid crystalline material are altered to allow detection of said at least one ligand.

Claim 2 (previously presented) The device of claim 1, wherein said at least one receptor is attached to the surface of each of said plurality of particles.

Claim 3 (previously presented) The device of claim 1, wherein each of the plurality of particles is a porous substrate and said at least one receptor is attached to at least one pore of a porous particle.

Claim 4 (previously presented) The device of claim 3, wherein a plurality of receptors are attached to and randomly distributed on the surface and within the pores of said porous particle.

Claim 5 (original) The device of claim 1, wherein the liquid crystalline material is selected from the group consisting of thermotropic liquid crystalline material and lyotropic liquid crystalline material.

Claim 6 (original) The device of claim 5, wherein the liquid crystalline material is a lyotropic liquid crystalline material.

Claim 7 (original) The device of claim 6, wherein the lyotropic liquid crystalline material is a lyotropic chromonic liquid crystalline material.

Claim 8 (original) The device of claim 5, wherein the liquid crystalline material is a thermotropic liquid crystalline material.

Claim 9 (previously presented) The device of claim 1, wherein the plurality of particles are made from a material selected from the group consisting of polymeric and inorganic materials.

Claim 10 (original) The device of claim 9, wherein the polymeric materials are selected from the group consisting of polyions, polyalkenes, polyacrylates, polymethacrylates, polyvinyls, polystyrenes, polycarbonates, polyesters, polyurethanes, polyamides, polyimides, polysulfones, polysiloxanes, polysilanes, polyethers, and polycarboxylates.

Claim 11 (previously presented) The device of claim 9, wherein the polymeric material is a polystyrene.

Claim 12 (previously presented) The device of claim 1, wherein the particles are substantially spherical.

Claim 13 (previously presented) The device of claim 9, where the plurality of particles are made from an inorganic material selected from the group consisting of glass, silicon, and colloidal gold.

Claim 14 (original) The device of claim 13, wherein the inorganic material is glass.

Claim 15 (previously presented) The device of claim 1, wherein said at least one receptor is attached to each of said plurality of particles by at least one mechanism selected from the group consisting of (i) chemical attachment and (ii) physical attachment.

Claim 16 (original) The device of claim 15, wherein said chemical attachment is covalent bonding.

Claim 17 (previously presented) The device of claim 15, wherein said physical attachment is selected from the group consisting of: hydrophobic interactions and van der Waals interactions.

Claim 18 (previously presented) A method for detecting ligands comprising:

providing a device for detecting ligands, said device comprising a plurality of particles; at least one receptor attached to each of said plurality of particles, wherein said at least one receptor is capable of binding to a ligand to form a receptor-ligand complex, and wherein said plurality of particles are positioned within a liquid crystalline material;

contacting a sample with the device, the sample including at least one ligand bindable to the receptor to form the receptor-ligand complex, and

detecting the presence of a ligand by means of a change in the optical characteristics of the liquid crystalline material generated by said receptor-ligand complex formation.

Claim 19 (previously presented) A device for the detection of ligands comprising:

a plurality of substantially spherical particles;

at least one receptor attached to each of said plurality of substantially spherical particles, wherein said at least one receptor is capable of binding to a ligand to form a receptor-ligand complex; and

an amplification mechanism comprising a liquid crystalline material, wherein the optical characteristics of the liquid crystalline material vary to detect the presence of said ligands upon receptor-ligand complex formation within the liquid crystalline material.

Claim 20 (previously presented) A device for detection of a ligand comprising:

an amount of liquid crystalline material, the liquid crystalline material having initial optical transmission characteristics;

a plurality of particles positioned in the amount of liquid crystalline material so as to be moveable therein;

at least one ligand receptor associated with the plurality of particles, the ligand receptor capable of attaching to a ligand, wherein upon attachment of a ligand to the receptor, the initial optical characteristics of the liquid crystalline material are altered; and

a detector for detecting a change in the initial optical characteristics of the liquid crystalline material to determine the presence of a ligand.

Claim 21 (currently amended) A method for detecting a ligand comprising the steps of:

providing an amount of liquid crystalline material having initial optical characteristics;

positioning a plurality of particles having at least one ligand receptor associated therewith, in the liquid crystalline material so as to be moveable throughout the liquid crystalline material; and

detecting a change from the initial optical characteristics in the liquid crystalline material indicating attachment of at least one ligand to the receptor and the presence of the ligand thereby.